UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,040	01/29/2004	Osamu Tsuboi	011459A	2577

23850 7590 11/02/2004

ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP
1725 K STREET, NW
SUITE 1000
WASHINGTON, DC 20006

EXAMINER	
PRITCHETT, JOSHUA L	

ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 11/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/766,040	TSUBOI ET AL.	
	Examiner	Art Unit	
	Joshua L Pritchett	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 19-29 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 19-29 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 29 January 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 1/04.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 19-25, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Behin (US 6,593,677) in view of McClelland (US 6,201,629).

Regarding claims 19 and 29, Behin teaches a micromirror unit comprising an inner frame (511), an electrode base (508), the frame provided with outwardly extending comb-teeth electrodes (505) and the electrode base provided with inwardly extending comb-teeth electrodes (506; Fig. 5); an outer frame (Fig. 5) surrounding the inner frame, the outer frame including a frame member (Fig. 5), a plurality of auxiliary portions (503, 504), at least one of the auxiliary portions with inwardly extending comb-teeth electrodes inerative with the outwardly extending comb-teeth electrodes of the inner frame (Fig. 5) at least another of the auxiliary portions being electrically separate from the one auxiliary portion (col. 9 lines 52-55); a mirror forming base (509) interactive with the inwardly extending comb-teeth electrodes of the inner frame (Fig. 5); an inner torsion connection (510) connecting the frame body of the inner frame to the mirror

forming base (Fig. 5); and an outer torsion connector (512) which connects the inner frame to the outer frame and defines an axis about which the inner frame and the mirror forming base are rotated relative to the outer frame (Fig. 5), the outer torsion connection having a width measured in the direction which is parallel to the mirror surface and perpendicular to the axis (Fig. 5); wherein the outer torsion connector comprises a plurality of torsion bars (Fig. 5), at least one of the torsion bars connecting the frame body of the inner frame to the frame member of the outer frame, at least another of the torsion bars connecting the electrode base of the inner frame to the auxiliary portion of the outer frame (Fig. 5). Behin lacks reference to the use of a mirror on the mirror forming base, but suggests the use of the apparatus in optical elements (abstract). Behin further lacks reference to the use of an insulating layer, but suggests electrical isolation of the components (col. 9 lines 52-55). Behin further lacks reference to the use of a torsion bar with a non-constant width. McClelland teaches the use of a mirror on the mirror forming base (4, Fig. 13B). McClelland teaches the use of an insulating layer (54) between the frame layer (55) and the electrode layer (56) in a micromirror unit (Fig. 13C). McClelland teaches the torsion bar having a non-constant width wherein the torsion bar becomes gradually smaller from the inner frame toward the outer frame (Fig. 19). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Behin invention include the teachings of McClelland for the purpose of making the Behin invention a micromirror unit for use in an optical element, while maintaining electrical isolation of the various components of Behin and allowing the inner frame to rotate with a smaller amount of applied voltage.

Regarding claim 20, Behin teaches the inner torsion connector defines an axis about which the mirror forming base is rotated relative to the inner frame (Fig. 5), the torsion connector

having a width measured in a direction which is parallel to the mirror surface and perpendicular to the axis. Behin lacks reference to the torsion connector having a non-constant width. McClelland teaches the torsion bar having a non-constant width wherein the torsion bar becomes gradually smaller from the inner frame toward the outer frame (Fig. 19). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Behin invention include the teachings of McClelland for the purpose of making the Behin mirror forming base rotate with a smaller amount of applied voltage.

Regarding claim 21, Behin teaches the axis of the inner torsion connector is perpendicular to the outer torsion connector (Fig. 5).

Regarding claim 22, Behin teaches the inner torsion connector includes a plurality of torsion bars (Fig. 5).

Regarding claims 23 and 24, Behin teaches the invention as claimed but lacks reference to the use of a non-constant width torsion connector. McClelland teaches the torsion bar having a non-constant width wherein the torsion bar becomes monotonically becomes smaller from the inner frame toward the outer frame (Fig. 19). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Behin invention include the teachings of McClelland for the purpose of making the Behin inner frame and mirror forming base rotate with a smaller amount of applied voltage.

Regarding claim 25, Behin teaches the inner torsion connector has on of a rectangular cross section, a circular cross section, and an elliptical cross section (Fig. 5).

Regarding claim 28, Behin teaches the invention as claimed but lacks reference to a curved connecting portion. McClelland teaches the torsion connector having a curved

connecting portion (Fig. 19). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Behin invention include the teachings of McClelland for the purpose of making the Behin inner frame rotate with a smaller amount of applied voltage.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Behin in view of McClelland as applied to claim 19 above, and further in view of Correll (US 4,688,662). Behin in combination with McClelland teaches the invention as claimed but lacks reference to the torsion connector having a hollow structure. Correll teaches the use of a torsion connector with a hollow structure (col. 1 lines 63-64). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Behin invention include the teachings of Correll for the purpose of making the Behin inner frame and mirror forming base rotate with a smaller amount of applied voltage.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Behin in view of McClelland as applied to claim 19 above, and further in view of Ralph (US 5,839,692).

Behin in combination with McClelland teaches the invention as claimed but lacks reference to the use of a bifurcated torsion connector. Ralph teaches the use of a bifurcating portion in a torsion connector (Fig. 3, 30). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Behin invention include the teachings of Ralph for the purpose of making the Behin inner frame and mirror forming base rotate with a smaller amount of applied voltage.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L Pritchett whose telephone number is 571-272-2318. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JLP

DREW A. DUNN
SUPERVISORY PATENT EXAMINER